Modifying the properties of plasmonic crystals through engineering of the primitive unit cell

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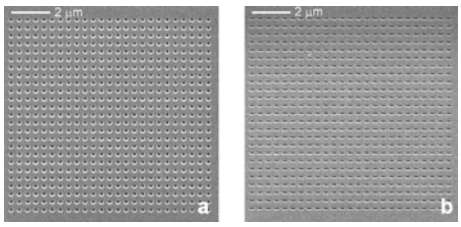

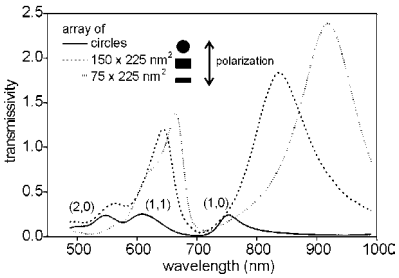

Extraordinary transmission, first observed by Ebbesen and co-workers, is one of the most beautiful phenomena in plasmonic crystals. This transmission has generally been attributed to a resonant excitation of surface plasmons set up by the periodicity of the array. *Here, we will show that this explanation cannot be the entire story.*

Contrary to expectations, by changing the shape of the sub-wavelength holes and thus engineering the primitive unit cell, we are able to enhance and, more importantly, change the peak positions.

[1] K.J. Klein Koerkamp, et al., *Phys. Rev. Lett*. **92**, 183901 (2004). [2] K.L. van der Molen, et al., *Appl. Phys. Lett.* **85**, 4316 (2004).